DOCUMENT RESUME

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TITLE	Teaching Algebraic Expressions (Module 7 from the Florida Series on Mathematics Teaching Competencies). Description of Teacher Inservice Education Materials.
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DESCRIPTORS	*Algebra; *Inservice Teacher Education; *Instructional Materials; Intermediate Grades; Mathematical Concepts; *Mathematics Instruction; Skill Development; *Teaching Techniques; Validated Programs

ABSTRACT

The described inservice teacher education learning module is designed for middle school teachers who are interested in better understanding the relationships of algebraic expressions. The contents of the module are outlined and the activities and resources involved in its use are described. Ordering information for materials is included as well as a critique of the module. (JD)

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ED 174565

DESCRIPTION OF TEACHER INSERVICE EDUCATION MATERIALS

SUMMARY INFORMATION

Title: TEACHING ALGEBRAIC EXPRESSIONS (Module 7 from the Florida Series on Mathematics Teaching Competencies)

Publication Date(s): Copyright 1974

Intended Users: Inservice mathematics teachers who are interested in better understanding the relationships of simple algebraic expressions

Grade Level(s): Middle school

Number: Individual or group

Primary Focus: The intent of the product is to help teachers improve certain mathematics teaching skills, specifically those which will facilitate teaching algebraic expressions to middle school students.

School subject(s) and/or inservice topic(s) covered:

The inservice topic covered in this module is teaching of algebraic expressions. The school subject focused is mathematics, specifically, algebra.

What participant does in using the materials:

The user reads the rationale and the objectives of the module, follows the directions on the self-analysis page, and takes the pretest--all or part, as s/he feels appropriate. The user then does the appropriate enabling activities and takes the posttest. If the module is used as course material, the user will follow much the same format as above but will work with an instructor and peers, and will participate in group discussion as an added activity.

Resources:

The material consists of a softcover booklet, one extra copy each of the user's contract, the facilitator's contract (necessary only if material is used in a course context), the prestest, the posttest, and an answer sheet for each. The booklet consists of 31 color-coded pages and 83 pages of appendices excerpted from mathematics tests for additional explanation and practice.

Describer critique:

The product is useful. It is well-designed and should enable users to acnieve its stated objectives. Technically, it is adequate, but the booklets do not seem to be durable. Although some of the content material--i.e., readings and films, is not included in the module; as it is, the module appears to offer a thorough coverage of its subject.

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1.0 PURPOSES:

Rationale

The rationale, as stated by the developer, is as follows: "Algebra may be thought of as a set of abstractions based on the real numbers. For example: 3+5 = 5+3 and similar examples may be abstracted to a+b = b+a for all real numbers. A basic understanding of the relationships between items like 3+5 = 5+3 and a+b = b+a enhances one's understanding of concrete facts and prepares one for a deeper study of numbers in algebra."

Goals

The goal of the module, as stated by the developer, is "to help a teacher develop or improve some specific mathematics teaching skills."

Objectives

The developer offers both general and specific objectives for users of this product:

"The general objective of this module is to assist the participant in understanding the relationships of simple algebraic expressions in the teaching of middle school students."

Specific objectives:

1. "The participant should be able to write and evaluate algebraic expressions with variables and constants, using correct order of operations."

2. "Upon completion of this module the participant will be able to add, subtract, multiply, and divide algebraic expressions."

3. "Upon completion of this module the participant will be able to factor an algebraic expression."

4. "Upon completion of this module the participant will be able to plan an effective lesson involving algebraic expressions."

2.0 CONTENT — Scope and Sequencing of Topics:

Scope

The contents of the 114-page booklet are listed below:

Rationale	p. 1
General Objectives	p. 2
Specific Objectives	p. 2
Self-Analysis	p. 3
Pretest	p. 4
Pretest Answers	p. 7
Analysis Chart	p. 9
Enabling Activities	p. 10
Posttest	p. 24
Posttest Answers	p. 25
Bibliography	
Readings	p. 28
Media	p. 29
Cross References	
Readings	p. 30
Media	p. 31
Appendices	
A. Variables and Open Sentences	p. A1-A26
B. Open Number Sentences	p. B1-B27
C. Factoring Monomials	p. C1-C11
D. An Example from Algebra	p. D1-D16
E. Cross Number Puzzle	p. E1

Sequence

A pretest is used to determine which of the objective areas the user needs to work on. The developer leaves the sequencing of the material to the user. The describer feels that those who are unfamiliar with the content of the module would benefit by using it sequentially and in its entirety.

3.0 ACTIVITIES AND RESOURCES INVOLVED IN USE OF PRODUCT

3.1 Description of main inservice activities:

If studying the material on an individual basis, the user reads the first three pages of the booklet, takes the pretest or part of the pretest, fills in the analysis chart, does the appropriate enabling activities, takes the posttest. (Both tests have answer sheets.) If studying the material in a group or course setting, the user will follow much the same format as indicated above, but will interact with peers and a facilitator or instructor. In the latter situation, pre- and posttests might be administered by the instructor (instead of self-administered) and the instructor may assign appropriate enabling activities.

3.2 Help given in use of product:

There are no teacher's manuals or guides provided with the product, and there are no guidelines for adaptation. All instructions necessary for completing the module are included in the booklet. The describer feels that the ideal instructor would be a specialist in mathematics.

4.0 EVALUATION OF TEACHER INSERVICE LEARNING

The module contains a pretest and a posttest which will be self-administered unless the material is used in a course, where they would usually be administered by an instructor.

5.0 ORDERING INFORMATION

5.1 Resources required/recommended for implementing product:

The developer does not indicate the length of time needed to successfully use the product. Presumably, this will be decided by users, based on their individual needs and purposes.

If the module is used by an individual, there are no space and equipment requirements. If the module is used as course material, classroom space and seating arrangements are required. An instructor or facilitator must be supplied, as well as other students.

5.2 Distributor name/address:

Panhandle Area Educational Cooperative
411 West Boulevard, South
Chipley, Florida 32420

(904) 638-4131

5.3 Components/approximate costs:

Component	Purchase	Rental	No. Req.	Reusable
TEACHING ALGEBRAIC EXPRESSIONS Module No. 7 from the Florida Series on Mathematics Teaching Competencies	$2.00	no	1/participant	yes
Consumable Materials	.25/set	no	1/participant	yes

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6.0 HISTORY OF DEVELOPMENT

6.1 Identification of the developer:

The developer of this product is Dr. Donald H. Bernard of the University of Florida. When the product was developed, Dr. Bernard was the Director of the Florida Middle School Mathematics Project. Dr. Bernard taught in elementary school (5th and 6th grades) for seven years and in high school for four years as well as at the university level. Others involved in the development of this module were: Sally McLean - Shell Middle School; Janet Hartman - University of Florida; Chris Toppe - University of Florida; Peter McCall - P.K. Young Laboratory School.

6.2 How developed and when:

The product was begun in 1973 and used the resources of a consortium of middle school mathematics teachers, students, professors, and county administrators in Florida. The product was field tested three times with teachers in eleven Florida counties, and was revised twice.

6.3 Evidence of effectiveness with users:

The product has been incorporated as part of inservice programs in 67 Florida counties.

The product was, as the result of field testing, re-edited for clarity and realism of content.

DESCRIBER CRITIQUE

Appropriateness / adaptability / technical quality:

The product is well designed and should adequately enable users to achieve its purpose to improve specific mathematics teaching skills. The product is adaptable for mathematics teachers for grades five through nine and could have value for tenth grade teachers as well. Technical quality of the product is acceptable. The book is softbound and is stapled together. The print is generally clear with a little blurring in the appendices. The describer found the graphics overly "cute" and sometimes sloppy.

Content accuracy/social fairness/community acceptance issues:

The content appears to be accurate and current. No ethnic or sex biases are evident. There is no content which should cause question or controversy among users.

Overall summary/comment:

The product is well-organized and easy to use. The format is clearly designed for its purposes. The section on lesson planning is especially thorough and well thought out. The appendices are a valuable addition to the text but would be even more helpful if answers had been provided for the written and oral exercises.

MB-10/77